

Applicant respectfully informs the Examiner that the rotation of metaphors in no way represents the "most obvious means for allowing the user to see the entire metaphor," but rather is a result of a specific, user-defined criteria. Via the user interface module, the user-defined criteria causes a real time analysis to be performed on the data inputted to the virtual reality generator, thereby controlling the manipulation of the metaphor. As explained in the Specification, an action indicator (e.g., a metaphor) can flash, spin or sound to indicate particular financial information, such as, for example, industrial stocks having a price earnings ratio in a relative industry greater than six. See Specification, p. 18, ll. 14 to p.19, ll. 34.

Applicant respectfully invites the Examiner to contact Applicant's attorney to discuss any questions relating to the present application.

III. The Examiner's Rejections Under
35 U.S.C. § 103 Should Be Withdrawn

Claims 85-125 stand rejected under 35 U.S.C. § 103 as being unpatentable over Cyberarts: Lanier of VPL on "Voomies" by Rohrbough (the "Rohrbough article") and Virtual Reality: a status report by Jacobson (the "Jacobson article"), in further view of Virtual reality offers growing opportunity for risk takers by Hindus (the "Hindus article"), Virtual Reality is almost real by Saffo (the "Saffo article"), PV-wave for Financial Applications ("PV-Wave 1"), PV-Wave Command Language ("PV-wave 2"), and PV-Wave Point and Click Visual Data Analysis Software ("PV-Wave 3"). Applicant respectfully submits that the references relied upon by the Examiner, either individually or in combination, including the combination of all six references relied upon by the Examiner, neither teach nor suggest the present invention. In addition, Applicant in no way admits that the references relied upon by the Examiner are prior art and Applicant reserves the right to swear back of the

references.

In making a § 103 rejection, each reference must be considered for all that it teaches, including disclosure that teaches away from the invention. Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 296 (Fed. Cir. 1985), cert. denied 475 U.S. 1017 (1986). Moreover, the test for whether a reference can be relied upon to show obviousness is whether the reference provides an enabling disclosure. Ashland Oil, 776 F.2d at 297; Beckman Inst., Inc. v. LKB Produkter AB, 892 F.2d 1547, 1551 (Fed. Cir. 1989); In re Epstein, 32 F.3d 1559, 1568 (Fed. Cir. 1994).

Applicant respectfully submits that the Examiner's two primary references, the Rohrbough and Jacobson articles, neither teach nor suggest the features of the present invention recited in the independent claims.

In particular, Applicant notes that the Examiner admits that "neither article teaches the details of the virtual reality system needed to implement" the applicant's invention. Office Action at 4. Not only does the Applicant agree that neither of the Rohrbough or Jacobson articles teaches the details needed to implement the present invention, but also the Applicant respectfully asserts that the acknowledged deficiency of the Rohrbough and Jacobson articles renders them nonenabling and therefore improper obviousness references with respect to the claimed invention. See Ashland Oil, 776 F.2d at 297; Beckman Inst., 892 F.2d at 1551; In re Epstein, 32 F.3d at 1568.

In addition to the nonenabling disclosure of the Rohrbough and Jacobson articles, Applicant respectfully submits that the present invention, as recited in independent claims 85, 104, 106, 118, 123, 124 and 125, is not obvious over the references relied upon by the Examiner for at least the following reasons.

For example, claim 85 recites a virtual reality

generator receiving financial information and having

a user interface module ... filtering the financial information to comply with the plurality of filter parameters; and

a virtual reality generator module generating, continuously modifying, and displaying on a display device a virtual reality world being a three dimensional interface that enables the user to simulate movement through and interact with the financial information

Similarly, Claim 104 recites a virtual reality generator receiving financial information and having

a virtual reality generator to generate and display a virtual reality world ... being a multidimensional representation of the stream of financial information ... to enable a user to simulate movement through the virtual reality world such that the user has a sensation of travelling through and within the virtual reality world

In contrast to the virtual reality generator recited in the independent claims, the entirety of the Rohrbough article arguably related to a virtual reality financial information system includes:

[] VR models of abstract information, like turning a financial database into a giant simulated structure, is being done because a physical model is easier for people to understand

The Rohrbough article nowhere even mentions, let alone teaches or suggests, a user interface module filtering financial information in accordance with filter parameters as recited in claim 85. As described in the Specification, the user interface module allows a user to cause a real-time analysis be performed on the data inputted to the virtual reality generator, thereby controlling manipulation of a metaphor, such as flashing or spinning, to indicate particular financial information selected by the user. See, Specification, p. 17, 1.23 to p. 26, 1.4. In addition, the Rohrbough article nowhere teaches or suggests a virtual reality generator module that displays a three dimensional virtual reality world that enables movement and interaction with the filtered

financial information or enables a user to simulate movement through the virtual reality world such that the user has a sensation of travelling through and within the virtual reality world, also as recited in claims 85 and 104, respectively.

Moreover, not only does the Rohrbough article fail to teach or suggest the virtual reality generator recited in the independent claims, it also fails to provide any information even relating to the implementation of a virtual reality financial information system. Thus, the Rohrbough article is nonenabling and not a proper obviousness reference with respect to the claimed invention. See Ashland Oil, 776 F.2d at 297; Beckman Inst., 892 F.2d at 1551; In re Epstein, 32 F.3d at 1568.

Also in contrast to the virtual reality generator recited in the independent claims, the Jacobson article fails to teach or suggest a virtual reality generator according to the present invention. With regard to a virtual reality financial information system, the Jacobson article states:

No longer confined to the research lab, virtual reality (VR) is coming to numerous diverse commercial fields: ... [including] financial modeling

Visualization techniques have been used for years in the science field, but the advent of faster, more powerful CPUs, real-time computer-graphics programs, and VR technology encourages financial experts to try the same approach. One idea ... suggests representing a security as a stalk of wheat. "You have a whole field of this wheat, and price fluctuations and market trends propagate like wind across the field. Program securities would turn a bright orange when they reach a particular price. Then stock analysts could put on the head-mounted display goggles and 'walk' up and down the fields to watch the way the market's moving"

The Jacobson article then goes on to state, however, that the article's virtual reality consultant "doesn't expect VR-based visualization systems to enter

the public trading arena any time soon," and further, that the necessary VR technology would only be available in "five or six years."

Similar to the Rohrbough article, the Jacobson article in no way teaches or suggests movement through and interaction with filtered financial information, as recited in claim 85, let alone a virtual reality generator that enables a user to simulate movement through the virtual reality world such that the user has a sensation of travelling through and within the virtual reality world, as recited in claim 104. To the contrary, the Jacobson article states that stock analysts could merely "watch the way the market's moving."

Further, like the Rohrbough article, the Jacobson article also fails to teach or suggest an implementation of a virtual reality financial information system. Indeed, the Jacobson article expressly indicates that no such systems exist, noting that "VR technology encourages financial experts to try" a virtual reality financial information system, and that "one idea suggests" a wheat stalk hypothetical; however, no such teachings are provided. Thus, the Jacobson article is nonenabling and not a proper obviousness reference with respect to the claimed invention. See Ashland Oil, 776 F.2d at 297; Beckman Inst., 892 F.2d at 1551; In re Epstein, 32 F.3d at 1568.

Although the Examiner admits that both the Rohrbough and Jacobson articles fail to provide an enabling disclosure of the present invention, the Examiner then asserts that the articles "suggest" that the level of a person skilled in the art at the time the present application was filed "was such that no undue experimentation would have been needed" to build a virtual reality generator according to the present invention. Office Action at 4.

Applicant respectfully disagrees with the Examiner's position regarding the level of one skilled in

the art of virtual reality systems. As presented above, neither the Rohrbough nor Jacobson articles provide an enabling disclosure of a virtual reality financial information system, as the Examiner acknowledges. Contrary to the Examiner's position, however, references in the articles to virtual reality systems for applications such as, for example, CAD-based building design or to build virtual molecules for medical research, in no way teach or suggest the level of skill of one skilled in the art of virtual reality systems with regard to the implementation of a virtual reality financial information system.

In particular, Applicant respectfully submits that the examples of virtual reality systems described in the Rohrbough and Jacobson articles involve the mapping of real-world objects e.g., a building or molecule to a real-world virtual reality object, e.g., a virtual reality building or molecule. In contrast, the present invention maps abstract information, i.e., financial information, to a virtual reality object. The limitations inherent in the mapping of a real world object to a real world virtual reality object in no way teach or suggest the mapping of abstract information to a virtual reality object.

Applicant is filing herewith a declaration under 37 C.F.R. § 1.132 which states that the implementation of a virtual reality financial information system would not have been obvious to one skilled in the art at the time of the Applicant's invention in view of the Rohrbough article and the Jacobson article, either individually or in combination. (Decl. ¶ 10). As identified in the declaration, it is well-established that virtual reality is a multidisciplinary hybrid technology in which it is necessary to link various disciplines. (Decl. ¶ 13). A virtual reality financial information system involves expertise in, for example, at least the fields of virtual reality and finance. (Decl.

¶ 10). As stated in the declaration, neither the Rohrbough nor Jacobson articles provide information sufficient to enable one skilled in the art to implement a virtual reality financial information system as described and claimed in the present application. (Decl. ¶ 10-12).

The Examiner's reliance on the Hindus and Saffo articles and the PV-Wave references to further demonstrate the level of one skilled in the art is misplaced. With respect to the Hindus and Saffo articles, these articles suffer the same deficiencies noted above with respect to the Rohrbough and Jacobson articles, namely, the articles fail to, in any way, teach or suggest the virtual reality generator recited in the independent claims. Moreover, as the Hindus and Saffo articles also fail to provide an enabling disclosure of a virtual reality financial information system, they are not proper obviousness references with respect to the claimed invention. See Ashland Oil, 776 F.2d at 297; Beckman Inst., 892 F.2d at 1551; In re Epstein, 32 F.3d at 1568.

Additionally, the Examiner's reliance on the PV-Wave references is completely inapposite. As discussed in the Response of Applicant to Protest, filed October 21, 1994 in application Serial No. 07/954,775, the parent application of the present application, the PV-Wave references describe a standard 3-D graphical display business visualization program. PV-Wave in no way teaches or suggests a virtual reality world in which a user can move through and interact with filtered financial information. Thus, while the Examiner is correct that a user could generate a 3-D cartesian graph of financial information via the PV-Wave application and navigate through the financial information via a standard graphical user interface (e.g., via commands, menus and macros using a keyboard or mouse), PV-Wave does not provide for "navigation" through a virtual reality

financial information which enables a user to simulate movement through the virtual reality world such that the user has a sensation of travelling through and within the virtual reality world, as recited in the independent claims.

Therefore, to the extent the Examiner maintains that the level of a person skilled in the art at the time the present application was filed "was such that no undue experimentation would have been needed" to build a virtual reality generator according to the present invention, which is apparently based on the Examiner's personal knowledge as no references cited by the Examiner teach or suggest such a virtual reality financial information system, Applicant respectfully requests that the Examiner provide an affidavit stating as specifically as possible the data supporting the Examiner's assertion. See MPEP 706.02(a); 37 C.F.R. § 1.107(b).

In addition, to the extent the Examiner asserts that a virtual reality system that models financial information would have included an input module, a user interface module, and a virtual reality generator module, as recited in claim 34, which assertion is apparently also based on the Examiner's personal knowledge as no references cited by the Examiner teach or suggest such a combination of elements, Applicant respectfully disagrees and requests an affidavit from the Examiner stating as specifically as possible the data supporting the Examiner's assertion. See MPEP 706.02(a); 37 C.F.R. § 1.107(b).

In further support of the nonobviousness of the present invention over the references relied upon by the Examiner, the Rule 132 Declaration filed herewith further includes evidence of commercial success, industry praise and copying. Assuming, arguendo, that the Examiner established a prima facie obviousness rejection, which Applicant believes is not the case, objective evidence such as commercial success must be considered before a

conclusion on obviousness is reached. Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc., 807 F.2d 955, 960 (Fed. Cir. 1986). Evidence of secondary considerations is entitled to great weight and can overcome even a prima facie obviousness rejection. Rosemount, Inc. v. Beckman Inst., Inc., 727 F.2d 1540, 1546 (Fed. Cir. 1984); Alco Standard Co. v. Tennessee Valley Authority, 808 F.2d 1490, 1500-01 (Fed. Cir. 1986), cert. dismissed, 483 U.S. 1052 (1987).

As stated in the Declaration, the virtual reality generator recited in the independent claims is sold under the trade name METAPHOR MIXER. (Decl. ¶ 15). METAPHOR MIXER has been a commercial success, with sales of over \$200,000. Included in the sales are purchases of the METAPHOR MIXER by: TIAA-CREFF, one of the world's largest pension funds; British Telecom; ABD/Dresdner Securities; and the United States Department of Defense. (Decl. ¶ 16).

In addition to commercial sales, the METAPHOR MIXER has received numerous awards and industry praise as the world's first virtual reality financial information system. In fact, Linda Jacobson, the author of one of the Examiner's primary references, has acknowledged that the Applicant's METAPHOR MIXER was the "first financial visualization application for VR." (Decl. ¶ 19).

Representative of the nonobviousness of the present invention, the Applicant's METAPHOR MIXER was nominated for a 1994 *Computerworld Smithsonian Award* in the Finance, Insurance & Real Estate Category. (Decl. ¶ 20). This award is widely recognized as the most prestigious award in the computer industry honoring innovative uses of information technology. The METAPHOR MIXER was nominated for this award by Intel Corporation, one of the world's leading innovative computer companies. (Decl. ¶ 20). In addition, by being nominated for the *Computerworld Smithsonian Award*, the METAPHOR MIXER is now part of the permanent research archive of the

Smithsonian Institution. (Decl. ¶ 20).

In addition to recognition by the Smithsonian Institution, the METAPHOR MIXER also was selected for a virtual reality display at the Guggenheim Museum Soho in New York from October 23 to November 1, 1993. (Decl. ¶ 21). The METAPHOR MIXER was one of five virtual reality worlds selected for display at the Guggenheim Museum. (Decl. ¶ 21). The Guggenheim display was part of the Intel Digital Education and Arts (IDEA) program designed to encourage innovative uses of computer technology.

The METAPHOR MIXER also has received significant industry praise as the first and leading virtual reality financial information system. For example, the METAPHOR MIXER has been featured in numerous financial and computing magazines including FORBES, AI, AMERICAN BANKER and RISK. (Decl. ¶ 22).

Furthermore, the present invention is being copied by competitor virtual reality companies. A copy of the advertisement for vrTRADER and VISIBLE DECISIONS, for example, clearly shows direct copying of the METAPHOR MIXER virtual reality financial information system. (Decl. ¶ 23).

Therefore, the objective evidence of commercial success, industry praise and copying set forth in the Rule 132 affidavit further demonstrate the nonobviousness of the present invention. Rosemount, Inc., 727 F.2d at 1546; Alco Standard, 808 F.2d at 1500-01. Furthermore, for the reasons discussed above, the six references relied upon by the Examiner, either alone or in combination, do not teach or suggest a virtual reality financial information system as recited in the independent claims.

Applicants respectfully submit that for the same reasons as set forth with respect to independent claims 85 and 104, the Examiner's rejection of independent claims 106, 118, 123, 124 and 125 also are

overcome. As claims 86-103, 105, 107-117, and 119-122 depend either directly or indirectly from and therefore include all of the limitations of their respective independent claim, these claims also are neither taught nor suggested by the six references relied upon by the Examiner.

With respect to the Examiner's provisional double patenting rejection of claims 85-125 as being unpatentable over claims 34-62 of co-pending application Serial No. 07/954,775, Applicant will take the appropriate action in due course upon the allowance of the pending claims by the Examiner.

IV. Conclusion

The invention of claims 85-125 is new, non-obvious, and useful. Applicant respectfully requests reconsideration and allowance of claims 85-125.

Respectfully submitted,
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